

1. Gas Laws $PV=nRT$

P is pressure in kPa (Pa if V is in m^3)

V is volume in litres

n is the number of moles, 6.02×10^{23} molecules/mole

R is constant 8.314 LkPa/molK or J/molK

Pa = N/m^2 L = 0.001 m^3 Pa m^3 = Nm = J

$W=Fd = P\Delta V$ - area in a P-V graph

T is temperature in **Kelvin!!!!!!**

If you have 1.0 L of gas at 101kPa at 20°C and it expands to 2.0L at the same pressure, what is the new temperature?

$PV=nRT$

$V_1/T_1 = V_2/T_2$

$T_2=T_1V_2/V_1$

$T_2= (20+273) \times (2)/(1)=586$ K (double)

Where did the energy come from?

You had to add heat. (depends on heat capacity)

What was the work done by the gas during the expansion?

$W=P\Delta V= 101kPa \times (2L-1L)= 101$ J